



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/720,572	03/22/2001	Graham Finlayson	SWIN 2166	3535

7812 7590 06/29/2005
SMITH-HILL AND BEDELL, P.C.
16100 NW CORNELL ROAD, SUITE 220
BEAVERTON, OR 97006

EXAMINER
LONG, HEATHER R

ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/720,572	Applicant(s) FINLAYSON, GRAHAM	
	Examiner Heather R. Long	Art Unit 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2001.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,31,32,45-47 and 57-100 is/are pending in the application.
4a) Of the above claim(s) 45-47,73-79 and 97-100 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1,2,31,32,57-71,80-90 and 92 is/are rejected.
7) ☒ Claim(s) 72, 91,93-96 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 22 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/5/2001</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
2. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

Art Unit: 2615

- (I) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Election/Restrictions

3. Applicant's election of claims 1, 2, 31, and 57-72 and 80-96 in the reply filed on 7/16/2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Furthermore, the Examiner will also include in the elected group of claims.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1, 2, 31, 32, 57-71, 80-90, and 92 are rejected under 35 U.S.C. 102(e) as being anticipated by Bryant et al. (U.S. Patent 6,700,613).

Regarding claim 1, Bryant et al. discloses an image recording apparatus for processing an image, the apparatus including: optical sensor means (28) for recording a first digital optical image of at least a

part of a scene illuminated by an illuminant light and for recording a second digital optical image of at least a part of substantially the same scene under substantially the same illuminant light (col. 7, lines 4-24); the light producing the first and second images undergoing different optical processing and means in communication with the optical sensor means for processing information relating to the first and second images (col. 7, lines 4-37), wherein the processing means relates one of the first and second images to the other of the first and second images (Fig. 9 depicts a processor (78) that combines the first and second images; col. 7, lines 25-28).

Regarding claim **2**, Bryant et al. discloses all the limitations as previously discussed with respect to claim 1 including that the processing means correlates the first and second images (it is inherent that the images are correlated in order to form the final image).

Regarding claim **57**, Bryant et al. discloses all the limitations as previously discussed with respect to claim 1 including that the first and second optical sensor means are provided for recording the first and second images respectively (col. 7, lines 7-18).

Regarding claim **58**, Bryant et al. discloses all the limitations as previously discussed with respect to claims 1 and 57 as well as disclosing that at least one of the first and second optical sensor means is relatively broadband optical sensor means, being responsive to at least two different distinct wavelengths of light within a broad spectrum of wavelengths (col.

Art Unit: 2615

4, lines 24-50; col. 7, lines 7-18 and 25-28; visible and invisible light are both detected).

Regarding claim **59**, Bryant et al. discloses all the limitations as previously discussed with respect to claims 1, 57, and 58 including that the wavelengths are at least 100 nm apart (col. 7, lines 25-28 - visible light includes wavelengths from 400-700nm).

Regarding claim **60**, Bryant et al. discloses all the limitations as previously discussed with respect to claim 1 including that the optical sensor means includes at least two types of optically sensitive elements responsive to respectively different wavelengths of light (col. 7, lines 7-18; the optical sensor means is responsive to visible light and infrared light).

Regarding claim **61**, Bryant et al. discloses all the limitations as previously discussed with respect to claim 1 including that the optical sensor means comprises a charge coupled device chip (28), the chip comprising an array of photoelectric detector pixels (col. 4, lines 15-23).

Regarding claim **62**, Bryant et al. discloses all the limitations as previously discussed with respect to claims 1 and 61 including that the pixels have a broad response centering on a particular wavelength of light (col. 4, lines 34-36; red, green, and blue signals are also separated when they are processed).

Regarding claim **63**, Bryant et al. discloses all the limitations as previously discussed with respect to claims 1 and 61 including that the CCD chip is coated with a filter (col. 4, lines 24-50).

Regarding claim **64**, Bryant et al. discloses all the limitations as previously discussed with respect to claim 1 including that the optical processing means comprises an optical filter (col. 4, lines 24-50; Figs. 1, 2, and 9).

Regarding claim **65**, Bryant et al. discloses all the limitations as previously discussed with respect to claims 1 and 64 including that the filter has characteristics such that its output is linearly related to its input (it is inherent that the filter has characteristics such that its output is linearly related to its input, especially for a visible light filter).

Regarding claim **66**, Bryant et al. discloses all the limitations as previously discussed with respect to claims 1 and 64 as well as disclosing that the response of the filter is a smooth function with respect to wavelength and the filter has an average transmittance of more than 30% (it is inherent that the filter is a smooth function with respect to wavelength and the filter has an average transmittance of more than 30%).

Regarding claim **67**, Bryant et al. discloses all the limitations as previously discussed with respect to claims 1 and 64 including that the filter produces an output which includes relatively more light of one wavelength than of another wavelength as compared with the input (visible light filters separate the red, green, and blue wavelengths, which would produce an output which includes relatively more light of one wavelength than of another wavelength as compared with the input).

Regarding claim **68**, Bryant et al. discloses all the limitations as previously discussed with respect to claims 1 and 64 including that the filter is located in the image light path before the optical sensor means (it is inherent that the filter is located in the image light path before the optical sensor means in order to capture the desired wavelengths).

Regarding claim **69**, Bryant et al. discloses all the limitations as previously discussed with respect to claim 1 including that first and second optical sensor means are provided by a single CCD chip which records the first and second digital optical images (Figs. 7 and 9).

Regarding claim **71**, Bryant et al. discloses all the limitations as previously discussed with respect to claims 1 and 69 including that the first and second images comprise different parts of the image recorded by the CCD chip in spatial terms or in terms of the frequencies of light recorded (col. 7, lines 7-18 and 25-28; the first and second images comprise different parts of the image recorded by the CCD chip in terms of the frequencies of light recorded).

Regarding claim **80**, Bryant et al. discloses all the limitations as previously discussed with respect to claim 1 including that the processing means (78) is microprocessor based, having electrical memory means (it is inherent that the processing is microprocessor based, which would include electrical memory means).

Regarding claim **81**, Bryant et al. discloses all the limitations as previously discussed with respect to claim 1 including that the processing

means (78) includes means for providing information relating to the spectral characteristics of the illuminant light (col. 7, lines 25-31).

Regarding claim **82**, Bryant et al. discloses all the limitations as previously discussed with respect to claims 1 and 81 as well as disclosing that the information relating to the spectral characteristics of the illuminant light is used to facilitate removal of at least some of any illuminant colour bias present in the recorded image (it is inherent that during the processing of the visible signal the processor would remove at least some of any illuminant colour bias present in the recorded image).

Regarding claim **83**, Bryant et al. discloses all the limitations as previously discussed with respect to claims 1 and 81 including that the processing means includes means for facilitating the removal of at least some of any demosaicing errors or interreflection errors or shadows present in the recorded image (it is inherent that during the processing of the visible signal the processor would remove at least some of any demosaicing errors or interreflection errors or shadows present in the recorded image).

Regarding claim **84**, Bryant et al. discloses all the limitations as previously discussed with respect to claims 1 and 81 including that the processing means includes means for providing information relating to the physics of the scene, such as the physical characteristics of the scene (it is inherent that the processing means includes means for providing

information relating to the physical characteristics of the scene in order to enhance the quality of image of the scene taken).

Regarding claim **31**, Bryant et al. discloses a method for recording an image, the method including the steps of: (a) recording a first digital optical image of at least a part of a scene illuminated by an illuminant light and recording a second digital optical image of at least a part of a substantially the same scene illuminated by substantially the same illuminant light (col. 7, lines 4-24); the light producing the first and second images undergoing different optical processing (col. 7, lines 4-37); and (b) processing information relating to the first and second images; wherein the processing step includes relating one of the first and second images to the other of the first and second images (Fig. 9 depicts a processor (78) that combines the first and second images; col. 7, lines 25-28).

Regarding claim **32**, Bryant et al. discloses all the limitations as previously discussed with respect to claim 31 including that the first and second images are correlated (it is inherent that the images are correlated in order to form the final image).

Regarding claim **85**, Bryant et al. discloses all the limitations as previously discussed with respect to claim 31 including that different optical processing results at least partly from the filtering of light producing the first or second image (col. 7, lines 25-31).

Regarding claim **86**, Bryant et al. discloses all the limitations as previously discussed with respect to claim 31 including that the different

optical processing is provided by the use of sensors responsive to respectively different frequencies of light in recording the first and second images (col. 7, lines 7-18 and 25-28; the first and second images comprise different parts of the image recorded by the CCD chip in terms of the frequencies of light recorded).

Regarding claim **87**, Bryant et al. discloses all the limitations as previously discussed with respect to claim 31 including that the first and second images comprise respectively different parts of a global image of a scene (it is inherent that the first and second images comprise respectively different parts of a global image of a scene).

Regarding claim **88**, Bryant et al. discloses all the limitations as previously discussed with respect to claim 31 as well as disclosing that the processing of the information relating to the first and second images provides an estimate of the spectral characteristics of the illuminant light (it is inherent that the first and second images provide an estimate of the spectral characteristics of the illuminant light when the images are captured).

Regarding claim **89**, Bryant et al. discloses a method for calibrating an image recording apparatus, the method being according to claim 31 (it is inherent that the image recording apparatus may be calibrated using the technique disclosed in claim 31 because the images are correlated).

Regarding claim **90**, Bryant et al. discloses all the limitations as previously discussed with respect to claims 31 and 89 including that the

Art Unit: 2615

method includes the carrying out of steps (a) and (b) for each of a plurality of different known illuminant lights and wherein step (b) includes the step of processing the information relating to the first and second images to provide an indication of the relationship therebetween (Fig. 26 shows at the end of the processing an adder to combine the first and second images together).

Regarding claim **92**, Bryant et al. discloses all the limitations as previously discussed with respect to claim 31 as well as disclosing that the first and second images relate to a scene illuminated by an unknown illuminant (col. 6, lines 63-65).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 70 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bryant et al. as applied to claims 1 and 69 above, and further in view of Yukawa et al. (U.S. Patent 6,256,066)

Regarding claim **70**, Bryant et al. discloses all the limitations as previously discussed with respect to claims 1 and 69 except that the first

Art Unit: 2615

and second sensor means may comprise respectively different parts of the chip.

Referring to the Yukawa et al. discloses that the first and second sensor means may comprise respectively different parts of the chip (Figs. 4 and 5A-5D).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used different parts of the sensor chip as taught by Yukawa et al. to obtain the first and second images to minimize readout times by only having to read out the entire sensor once as compared to twice when the first and second images uses the entire sensor chip.

5. Claims 89 and 90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kupersmit (U.S. Patent 5,734,337) in view of Bryant et al. (U.S. Patent 6,700,613).

Regarding claim **89**, Kupersmit discloses a method for calibrating an image recording apparatus using the same method the apparatus would use to capture images.

Referring to the Bryant et al. reference, Bryant et al. discloses the method of capturing an image as claimed in claim 31 (see claim 31 above).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have calibrated the camera using the same method as the apparatus uses to capture an image as

Art Unit: 2615

taught by Kupersmit in order to provide a higher image quality for the outputted image.

Regarding claim **90**, Kupersmit in view of Bryant et al. disclose a method wherein the method includes the carrying out of steps (a) and (b) for each of a plurality of different known illuminant lights and wherein step (b) includes the step of processing the information relating to the first and second images to provide an indication of the relationship therebetween (Bryant et al.: col. 7, lines 25-31).

Allowable Subject Matter

6. Claims 72, 91, and 93-96 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: prior art fails to teach or fairly suggest an image recording apparatus or method for processing an image, in combination with all of the other elements claimed, wherein...

a. A filter is provided in front of or on a part of the CCD chip such that the first or second digital optical image is recorded by that part of the chip, and the other of the digital optical images is recorded by the remainder of the chip (claim 72).

Art Unit: 2615

- b. The indication of the relationship is a transform matrix, and the method provides a set of reference transform functions, each transform function relating to a different known illuminant light (claim 91).
- c. The method includes the step of applying one or more of the reference transform functions to the first or second image and determining the reference transform function which best relates the two images (claim 93).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Heather R. Long whose telephone number is 571-272-7368. The examiner can normally be reached on Mon. - Thurs.: 7:00 am - 4:30 pm, and every other Fri.: 7:00 am - 3:30 pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on 571-272-7593. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2615

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Heather R Long
Examiner
Art Unit 2615

HRL
June 13, 2005



DAVID L. OMETZ
PRIMARY EXAMINER